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TITLE: Enhanced virus-mediated DNA transfer

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INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Williams; David A.	Indianapolis	IN	N/A	N/A

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CLAIMS:

What is claimed is:
1. A method for obtaining a transduced population of viable mammalian cells by a retrovirus, comprising:
infecting the viable mammalian cells with a retrovirus in the presence of an effective immobilized amount of substantially pure fibronectin, substantially pure fibronectin fragments, or a mixture thereof, to increase the efficiency of transduction of the viable mammalian cells by the retrovirus, said infecting being conducted in a medium essentially free from a polycationic agent which increases the efficiency of transduction of the viable mammalian cells by the retrovirus in co-culture, but which agent reduces the efficiency of transduction of the cells by the retrovirus in the presence of said substantially pure fibronectin, substantially pure fibronectin fragments, or mixture thereof.
2. The method of claim 1 wherein the cells comprise hematopoietic stem cells.
3. The method of claim 1, wherein said cells are human cells.
4. A method for obtaining a transduced population of viable mammalian cells by a retrovirus, comprising:
infecting the viable mammalian cells with a retrovirus in the presence of an effective immobilized amount of substantially pure fibronectin, substantially pure fibronectin fragments, or a mixture thereof, to increase the efficiency of transduction of the cells by the retrovirus, said infecting being conducted in a medium essentially free from a polycationic agent which increases the efficiency of transduction of the viable mammalian cells by the retrovirus in co-culture, but which polycationic agent reduces the efficiency of transduction of the viable mammalian cells by the retrovirus in the presence of said substantially pure fibronectin, substantially pure fibronectin fragments, or mixture thereof, said infecting forming a population of viable mammalian cells transduced at an efficiency greater than that which would be achieved in the presence of said polycationic agent.
5. The method of claim 4 wherein said infecting is conducted in a medium free from retroviral co-producer cells.
6. The method of claim 4, wherein the immobilized fibronectin, fibronectin fragments, or mixture thereof contains an amino acid sequence which provides the cell-binding activity of the CS-1 domain and an amino acid sequence which provides the retrovirus binding activity of the Heparin-II domain.
7. The method of claim 6, wherein the amino acid sequence which provides the retrovirus binding activity of the Heparin-II domain includes the amino acid sequence of SEQ ID NO:1.
8. The method of claim 6, wherein the amino acid sequence which provides the cell-binding activity of the CS-1 domain includes the amino acid sequence of SEQ ID NO:2.

9. A method for obtaining a transduced population of viable hematopoietic cells, comprising:
providing an in vitro population of hematopoietic cells;
infecting the hematopoietic cells with a retrovirus in the presence of substantially pure fibronectin, substantially pure fibronectin fragments, or a mixture thereof, said infecting being conducted in a medium essentially free from a polycationic agent which increases the efficiency of transduction of the hematopoietic cells by the retrovirus in co-culture, but which polycationic agent reduces the efficiency of transduction of the hematopoietic cells by the retrovirus in the presence of said substantially pure fibronectin, substantially pure fibronectin fragments, or mixture thereof.
10. The method of claim 9, wherein the immobilized fibronectin, fibronectin fragments, or mixture thereof contains an amino acid sequence which provides the cell-binding activity of the CS-1 domain and an amino acid sequence which provides the retrovirus binding activity of the Heparin-II domain.
11. The method of claim 10, wherein the amino acid sequence which provides the retrovirus binding activity of the Heparin-II domain includes the amino acid sequence of SEQ ID NO:1.
12. The method of claim 10, wherein the amino acid sequence which provides the cell-binding activity of the CS-1 domain includes the amino acid sequence of SEQ ID NO:2.
13. The method of claim 10, wherein the amino acid sequence which provides the retrovirus binding activity of the Heparin-II domain includes the amino acid sequence of SEQ ID NO:1, and wherein the amino acid sequence which provides the cell-binding activity of the CS-1 domain includes the amino acid sequence of SEQ ID NO:2.
14. A method for obtaining a transduced population of viable mammalian cells by a retrovirus, comprising:
infecting the viable mammalian cells with a retrovirus in the presence of an effective immobilized amount of polypeptide comprising a first amino acid sequence of SEQ ID NO:1, and a second amino acid sequence of SEQ ID NO:2, said infecting being conducted in a medium essentially free from a polycationic agent which increases the efficiency of transduction of the viable mammalian cells by the retrovirus in co-culture, but which polycationic agent reduces the efficiency of transduction of the viable mammalian cells by the retrovirus in the presence of said polypeptide, said infecting forming a population of viable mammalian cells transduced at an efficiency greater than that which would be achieved in the presence of said polycationic agent.